voltages for the respective comparators to different values enables the number of lit LEDs 53_1 - 53_3 to be varied according to the amplitude of an input waveform so as to facilitate a staged or step by step display. In case of Fig. 16, the output of the amplifier 51 is dividedly supplied to respective input terminals 52_1-1 - 52_3-1 of the comparators 52_1 - 52_3, so that when an input voltage Vin at each input terminal exceeds the corresponding one of the reference voltages V_1 - V_3 at the reference input terminals, the corresponding one of the LEDs 53_1 - 53_3 is lit according to the above-mentioned logic. That is, by properly adjusting the reference voltages V_1 - V_3, the number of lit LEDs 53_1 - 53_3 can be varied according to the amplitude of the input waveform.

IN THE CLAIMS:

Please cancel claims 1-13 without prejudice or disclaimer.

Please add the following new claims:

14. A structure inspection apparatus comprising:

a vibration unit for generating an elastic wave in a measuring object of a concrete structure;

a vibration detector adapted to be placed in contact with a surface of said measuring object for detecting a component in a predetermined frequency range of an elastic vibration generated on the surface of said measuring object by said vibration unit; and

a display device for displaying a maximum amplitude of an output signal of said vibration detector.

15. The structure inspection apparatus as set forth in claim 14, wherein said vibration detector comprises:

a weight;

a spring having one end thereof connected with a contactor which is adapted to be in contact with said measuring object, and the other end thereof connected with said weight; and

a vibration sensor connected with said weight for converting a vibration of said weight into a corresponding electric signal;

wherein a resonance frequency determined by a mass of said weight and a spring constant of said spring is set to be within said predetermined frequency range, so that a component in said predetermined frequency range of an elastic vibration generated on the surface of said measuring object is detected by said vibration sensor.

16. The structure inspection apparatus as set forth in claim 14, wherein said vibration detector comprises:

a spring connected with a contactor which is adapted to be in contact with said measuring object, said spring being made of a metallic material of which permeability is varied according to a bending distortion thereof;

a coil arranged around said spring which acts as a core member; and

a weight connected with said spring;

wherein a bending distortion produced in said spring by an elastic vibration generated on the surface of said measuring object is detected by said coil.

17. The structure inspection apparatus as set forth in claim 14, wherein said vibration unit comprises: a striking section for vibrating said measuring object thereby to generate an elastic wave; a coil fixed to said striking section;

a diode connected with said coil for permitting a current to flow through said coil only in one direction; and

a magnet fixedly arranged near said coil in the surroundings of said striking section for generating a magnetic field in a direction in which said coil vibrates;

wherein damping is caused only in one direction of the vibration of said striking section by means of an electromagnetic interaction between said magnet and said coil.

18. The structure inspection apparatus as set forth in claim 14, wherein said vibration unit comprises:

a striking section for generating an elastic wave on said measuring surface;

a chamber in which said striking section is accommodated; and

a striking section operating mechanism for injecting a pressure medium into said chamber thereby to project said striking section outward from said chamber;

wherein said striking section operating mechanism generates an elastic wave on said measuring surface by applying thereto a fixed vibration force by means of said striking section.

19. The structure diagnosis apparatus as set forth in claim 18, wherein said striking section operating mechanism comprises: an injector for injecting a pressure medium into said chamber; and a pressure medium feeding mechanism for supplying a pressure medium to said chamber when a distance between said chamber and said measuring surface becomes a predetermined value.

20. The structure diagnosis apparatus as set forth in claim 19, wherein said pressure medium feeding mechanism comprises:

a gas cylinder for reserving said pressure medium;

a pressure regulator for regulating the pressure of said pressure medium in said gas cylinder;

a supply switch for supplying said pressure medium in said gas cylinder to said injector through said pressure regulator; and

a trigger mechanism for triggering said supply switch when the distance between said chamber and said measuring surface becomes a predetermined value.

21. The structure diagnosis apparatus as set forth in claim 19, wherein said pressure medium feeding mechanism comprises:

a compressor connected with said injector for supplying said pressure medium thereto;

a supply switch for supplying said pressure medium in said compressor to said injector; and

a trigger mechanism for triggering said supply switch when the distance between said chamber and said measuring surface becomes a predetermined value.

22. The structure diagnosis apparatus as set forth in claim 20, wherein said pressure medium feeding mechanism further comprises a spring having one end thereof connected with a housing of said vibration unit and the other end thereof connected with said trigger mechanism for urging said trigger mechanism in a direction away from said supply switch.

23. The structure diagnosis apparatus as set forth in claim 21, wherein said pressure medium feeding mechanism further comprises a spring having one end thereof connected with a housing of said vibration unit and the other end thereof connected with said trigger mechanism for urging said trigger mechanism in a direction away from said supply switch.

24. The structure diagnosis apparatus as set forth in claim 14, wherein said display device comprises:

an amplifier having an input terminal connected with said vibration detector and an output terminal;

a plurality of comparators each having a first input terminal connected with the output terminal of said amplifier, a second input terminal to which a reference voltage is imposed and an output terminal, said comparators being arranged in parallel with one another and each generating an output from its output terminal when an input voltage at its first input terminal exceeds the reference voltage at its second input terminal; and

a plurality of display members connected with the output terminals of said comparators, respectively;

wherein the reference voltages imposed on the output terminals of said comparators, respectively, are set to different values.

25. The structure diagnosis apparatus as set forth in claim 14, wherein said predetermined frequency range of said elastic vibration is several kHz or less.

26. A structure diagnosis method for detecting an internal defect in a concrete structure, said method comprising:

a first step of generating an elastic wave on a measuring surface of a measuring object by applying a fixed force thereto;

a second step of converting a vibration generated on said measuring surface in said first step into a corresponding electric signal thereby to calculate a maximum amplitude of a component in a predetermined frequency range of said electric signal; and

a third step of comparing the maximum value of said electric signal with a preset threshold thereby to detect the existence or absence of an internal defect in said structure.

27. The structure diagnosis method as set forth in claim 26, wherein said predetermined frequency range of said electric signal is several kHz or less.